

## APPLICATION OF TAGUCHI METHOD FOR OPTIMIZING THE ADSORPTION OF LEAD IONS ON NANOCOMPOSITE SILICA AEROGEL ACTIVATED CARBON

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### ABSTRACT

*Using the Taguchi method, this study analyzes the optimum conditions for removal of lead from aqueous solution in batch method by Nanocomposite Silica Aerogel Activated Carbon (SA-AC), which is prepared using the sol gel method. The controllable factors used in this study consisted of the following: (1) pH of the solution(A); (2) adsorption temperature(B); (3) lead initial concentration(C); (4) adsorbent dosage(D); (5) contact time (F).The effects of each factor were studied at four levels on the removal efficiency of lead from aqueous solution.  $L_{16}$  orthogonal array (OA) has been used for experimental design. Concentrations of lead were assessed by flame atomic absorption spectrophotometer. The statistical analysis revealed that the most important factors contributing to the removal efficiency are pH of the solution and adsorption temperature. The study shows that the Taguchi's method is suitable to optimize the experiments for total lead ions removal. The total optimum adsorptive removal of lead ions were obtained with  $C_0 = 10 \text{ mgL}^{-1}$ ,  $T = 65^\circ\text{C}$ ,  $\text{pH} = 6$ ,  $m = 0.16 \text{ g}$  and  $t = 6 \text{ h}$ .*

**Keywords:** Lead; Adsorption; Nanocomposite; Taguchi; Silica aerogel